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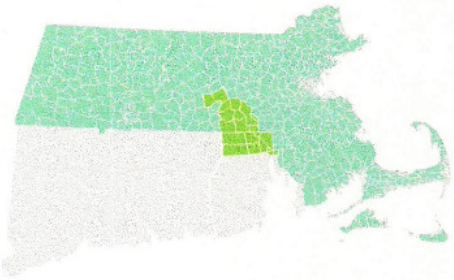
## *A Snapshot at a Moment in Time*

Zenia Kotval, John Mullin, and Robert Rochefeau

THE ECONOMIC RESILIENCE OF THE BLACKSTONE VALLEY MILLS ILLUSTRATES THE VIABILITY OF A FLEXIBLE-USE BUSINESS STRATEGY FOR NEW ENGLAND'S MILLS AND MILL COMPLEXES.

Over the past twenty years, mill community after mill community across New England struggled to regain economic vitality. In communities such as Fall River, Massachusetts, and Saco-Biddeford, Maine, the recovery has been ever so slow, with a sustainable recovery not achieved to date. In other places, as in Pittsfield's old General Electric complex or in Worcester's Southworks, the facilities were so polluted or outmoded that there was little choice but to demolish them. And yet, for every example of slow recovery or demolition, one can find example after example of old mills that have been revitalized and which are once again contributing to the local tax base.[1] As architectural critic Robert Campbell wrote: "New England . . . is the heartland of successfully converted industrial architecture."[2] Moreover, these old mills have proven quite adaptable for a myriad of uses.[3] Manchester's (New Hampshire) Amoskeag mill yard includes a branch of the University of New Hampshire; Olneyville (Rhode Island) mills are being converted into mixed uses, ranging from residences to offices and to some manufacturing; and Groton's West Groton Mill houses senior citizens. There is much more: Clinton's carpet works houses a 21st century plastics firm; Connecticut's Mansfield Mill has returned to manufacturing; and the old Sprague Works in North Adams is now the home of the sprawling Massachusetts Museum of Contemporary Art.[4] The list of conversions has been extensive and more are under way, including mills in Lawrence and Ludlow. At the same



time, hundreds of these mills (there is no accurate count) tucked away in community after community await revival or demolition.

### Why Revitalization Matters

We hope that they have a future. These mills — whether in cities as large as Lowell or Chicopee, or in villages as small as Slatersville, Collinsville or Manville — are critical to the well-being of their communities for several reasons. First, perhaps more than any other set of buildings, they have defined and continue to define the morphology of our mill-town landscape. For examples, visit New Hampshire's Harrisville, Massachusetts' Gleasondale or Rhode Island's Albion.[5] All have, to varying degrees, the same qualities. Most essential is that they are all on a valley floor adjacent to a river or stream with sufficient flow and drop (or fall) to power a nearby mill complex. The river would have at least one dam and a sluiceway crossing it with either water wheels or turbines to convert the flow to power. Along the river's bank would be a railroad and a vehicular road connecting the mill to distant places. The mill itself, usually four or five stories, would typically be brick or granite. Clustered close by on land near the river and within walking distance of the mill would be mill residences, including small single family houses, duplexes, boarding houses, and apartment blocks. Moving away from the valley floor and up its hills would reveal the homes of the specialists, foremen, senior staff members, and owner/mill agent. Usually near the dam one could find the church, school, and a small retail center. Time after time, as we cross New England, these elements appear.[6]

Second, these mills are an enduring touchstone to our culture and sense of innovation. In these mills we made things and, to some degree, continue to do so. The late Jane Jacobs described the products of these special places as follows:

> *In the nineteenth century, saws and axes made in New England cleared the forests of Ohio; New England ploughs broke the prairie sod, New England scales weighed wheat and meat in Texas; New England serge clothed businessmen in San Francisco, New England cutlery skinned tans to be tanned in Milwaukee and sliced apples to be dried in Missouri; New England whale oil lit lamps across the continent; New England blankets warmed children by night and New England textbooks preached at them by day; New England guns armed the troops; and New England dies, lathes, looms, forges, presses and screwdrivers outfitted factories far and wide.*[7]

And writing on a visit to Connecticut River Valley at the close of President Kennedy's campaign, Theodore White wrote:

> *The strange sense of American history, overlapping in the sequence of time, weighed heavily on all of us. Here in the Waterbury-Springfield-Torrington-Hartford quadrangle of New England had happened one of those episodes in man's history similar to the episode of Athens in its age of splendor. In this quadrangle, a century and a quarter ago, an outburst of Yankee genius had invented the technology of America and the world — all the arcane secrets of machine tools, precision machinery, interchangeable parts, mass production, alloys and tolerances had been worked out here first . . .*[8]

Even today in places like Maynard's Clock Tower Place, new products are emerging from small companies with strange names like Tizor Systems, BlackFriars Communications Inc., and the Earthwatch Institute.[9] The complex even houses ex-Red Sox pitcher Curt Schilling's computer game company, 38 Studios.[10] All one has to remember is the humble beginnings of the Digital Equipment Corporation at this very site.[11]

Third, the mills represent stability. Despite being nestled in valleys, their shear size, chimneys, and mill clocks dominate the landscape and appear as strong as rocky outcroppings. Even though they may be in decline, under revitalization, or welcoming new uses, they are typically the most crucial structures in the community. And they are irreplaceable. When they are destroyed, new zoning, environmental, building, and flood plain regulations take effect, seldom replicating the earlier dimensions, historic uses, construction materials, and footprint. Communities that have destroyed mill complexes are often left with forlorn spaces that give one a sense of emptiness and feeling of a void in community life.

While recognizing the importance of these special complexes, we are also becoming increasingly aware of the need to practice smart growth and green construction principles. These mill complexes contribute immensely to smart growth in that most often they are at the central core of the community, benefiting from an array of utilities and, often, mass transit. One does not have to build new roads or water, sewer, or fiber optic systems to make them work. One does not have to build in a greenfield leaving a brownfield behind. And one knows that there is sufficient worker housing nearby. In terms of green construction principles, these sites lend themselves to photovoltaic systems, geothermal operations, and even the revitalization of old dams to create electricity. Despite being built under 19th century standards, they can and do meet the accepted principles of sophisticated economic development planning for the 21st century.

If we agree on the value of these assets, then shouldn't we expect a groundswell of interest in these old structures? Shouldn't they be gaining in assessed value because of buyer interest? Shouldn't they be candidates for significant investments by developers and opportunities for public-private entrepreneurial partnerships? And shouldn't communities, fully aware of their importance, recognize them as candidates for action in their master plans? We thought the answers to all of these questions would be yes — that those complexes would attract increasing developer interest and that the structures, if in condition to be revitalized, would no longer have negative assessed value. We also expected that cities and towns would create workable public-private partnerships, and that the master plans would call for community action for revitalization. We based our premise on our own mill revitalization planning, consulting, and research across New England; a review of state and municipal policies and plans; and conversations with mill revitalization developers.

### The Blackstone Valley Experience

To test our perceptions, we decided to analyze the mill revitalization experiences of the communities along the Massachusetts section of the Blackstone Valley. The Blackstone River Valley is 46 miles long, extending from Worcester to Providence. It comprises 24 communities, all of which housed mill complexes ranging from the former Washburn and Moen Wire Works in Worcester to the Whitin Machine Works in Whitinsville and to one of the most beautiful mills ever designed (and substantially lost due to fire) — Uxbridge's Crown and Eagle Mill.[12] The home of several of Samuel Slater's mills and the utopian mill town of Hopedale, the valley is often considered the starting point of the American Industrial Revolution. On November 10, 1986, an Act of Congress honored the valley as the nation's first national historic industrial corridor (now called the John H. Chaffee Blackstone River Valley National Historic Corridor).[13] That milestone remains a significant event in stimulating the valley's revitalization.

Since World War II, the valley had settled into a slow, gentle period of economic decline. Its wire, tool, machine, and textile firms were forced into bankruptcy, closed up shop, or moved elsewhere. As this unfolded, the two anchor cities at either end of the valley, Worcester and Providence, were also in dire straights as people and businesses moved elsewhere, stripping them of much of their vitality. It became a largely a forgotten section of New England.

In the 1990s, however, several significant events began to revive the valley. The first was the aforementioned National Heritage Corridor. As with the creation of Lowell's National Park eight years earlier in 1978, it engendered a strong sense of pride among the residents and a feeling that, despite hard times, the federal government would become a protector, nurturer, and investor.[14] And it did so with minimal funding. Nonetheless, the park's role became a confidence builder in the valley's future.

The second event was the creation of several highway improvements that dramatically enhanced the speed and access by which valley residents could move to the region's job centers. To the south, Rhode Island created Interstate Route 295, which curved around Providence and provided faster access to the south side of the valley toward Boston as well as points south.

Another improvement was the widening of Massachusetts State Route 146 from a two-lane to a four-lane divided highway with speed limits of 65 mph. This highway made quick access available to commuters to Worcester and Providence. Finally, the creation of the Mass Turnpike's (I-90)–Route 146 interchange in Millbury dramatically increased the ease with which travelers could access highways to Worcester and Boston.

At the time of these improvements, Worcester and Providence were benefitting from many successful revitalization projects. In the core of Worcester, its convention center, double stacked rail capability, downtown medical complex, and highly successful revitalization of Union Station as a working terminal for ten trains per day to Boston were critical improvements. With other improvements, including a new courthouse complex, several new hotels and revitalized buildings, the city has strengthened its position as the economic engine of central Massachusetts. To the southeast, improvements in Providence were even more spectacular. A successful downtown mall adjacent to new hotels and office buildings and a beautifully designed river walk helped the city to sparkle. Indeed, with the most generous investment tax credit in the nation for the revitalization of old mills, Providence is well-poised for even more growth, in spite of the current severe recession, which has brought developments in both Worcester and Providence to a virtual stop. With the end of the recession, we hope and trust that economic growth will begin anew in both cities.

These transformations dovetailed with new growth along Boston's Interstate 495, approximately five miles east of the valley. In fact, the westward expansion of jobs from Boston, at least until the onset of the recession, increasingly moved the job center of the Boston Metropolitan Area toward Hopkinton, one exit east of the Mass Pike exit to the valley. The highway improvements, increased prosperity in Worcester and Providence, and the westward expansion of jobs all stimulated economic growth in the valley. Where the population between 1980 and 1990 had declined, it has increased over the last twenty years by 25 percent.[15] Median housing prices have steadily increased by 130 percent on average between 1996 and 2006.[16] While none of these figures is spectacular, they do create a picture of a region that is on the road to an economic resurgence.

## Mill Revitalization in the Valley: An Empirical Study

But where do the mills fit in this portrait? Has the westward movement of the Boston economic tsunami been sufficiently powerful to make them attractive for growth? Here is a snapshot of our findings of forty mills studied in 10 towns in the Blackstone Valley[17]: The largest percentage of mills (20%) was in Millbury, followed by Grafton and Northbridge (15% each); then by Leicester, Sutton and Uxbridge (12.5% each); Douglas (5%); and Blackstone, Hopedale, and Upton (2.5% each). The majority of the mills are owned locally, which is good for targeting redevelopment efforts. Seventeen of the 40 mills studied were either vacant, in very poor condition, or partially demolished. One-fifth of the mills had been extensively redeveloped, while one-third were in the process or planning redevelopment. Northbridge had undertaken extensive redevelopment in three of its six mills. Mills undergoing minor redevelopment were reusing their space commercially, while 63 percent of the mills that had undergone extensive redevelopment were reusing their space for housing–residential initiatives.

Of the six extensively redeveloped mills that were required to pay taxes, five (83%) yielded higher tax contributions in 2008 than in 2000, indicating that extensive redevelopment may have increased town revenues through property taxes. Notably, mills that were redeveloped for housing or commercial uses yielded higher growth in tax revenue than mills that were redeveloped for industrial uses.

The accompanying tables present mixed results. In Millbury, where the new I-90–Route 146 intersection sits, the westward movement would appear to have had an impact. Of its eight mill complexes, all increased in assessed value and tax revenue payments between 2000 and 2008. However, the range of increased tax revenue payments was significant with the Cesyl Mills, on the low end, only increasing by 9 percent while the Cordis Mills, on the upper end, after major revitalization to high end housing, increased twelve fold from $9,853 to $118,600. The Cordis Mills is a classic public-private success story. The town played a key role in locating grants, lowering taxes, and effecting a zone change to residential uses. The state also provided funding for brownfield remediation. The Town of Millbury has identified four other mills in which it is playing an active role. One of these is the Cesyl Mills, which is in active industrial use. While hardly a place of aesthetic charm, it bustles with lower-to-middle-class

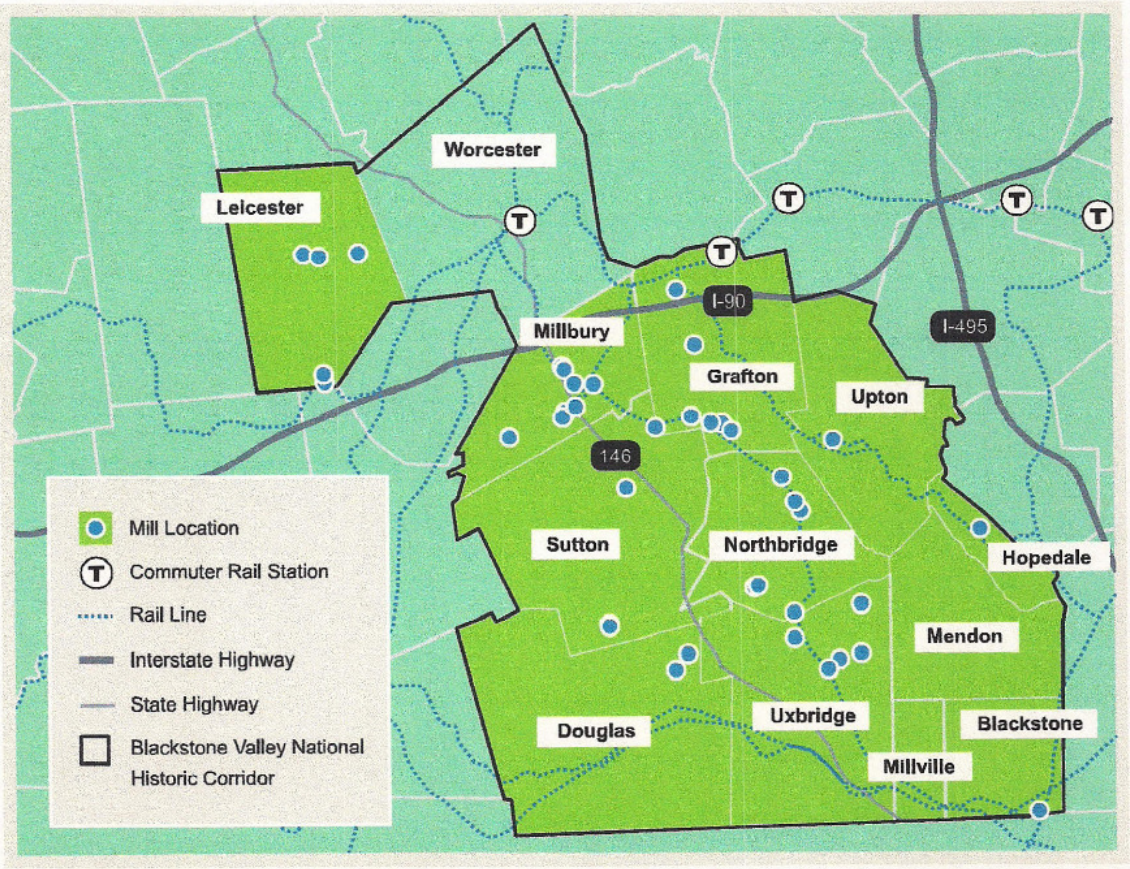


**Table 1: Change in Tax Revenue Contributions for Mills Extensively Redeveloped in the Blackstone Valley**

| Mill | Town | % Change in tax payment '00 to '08 | Use |
|---|---|---|---|
| **Cordis Mills** | Millbury | 1,104% | Housing |
| **Whitin Cotton Mills Apartments** | Northbridge | 59% | Housing |
| **Millhaus Apartments** | Upton | 30% | Housing |
| **Hayward Landing Mill** | Douglas | -13% | Housing |
| **Whitin Machine Works - The Shops** | Northbridge | 28% | Commercial |
| **Manchaug Mill #1** | Sutton | 7% | Commercial |
| **The Crown & Eagle Mill** | Uxbridge | tax exempt | Housing |
| **Whitin Mill** | Northbridge | tax exempt | Mixed-Use |

Source: Authors' research

manufacturing jobs. The town wants to retain these jobs while ensuring that the mill site continues to improve. This will be no easy task. The other mill sites, whether industrial or commercial, remain active but will be exempt from specific municipal or state actions.

While Millbury had the most mills with increased tax revenue payments, Leicester, Uxbridge and Grafton had the fewest. Of Leicester's five mills, four declined in tax revenue payments from 2000 to 2008, ranging between -15 and -67 percent. Only its Watson Mill increased in tax contributions, and by a small 3 percent. All of this occurred while the total percentage change of tax revenue payments across the town increased by 59 percent. Leicester does not have the locational advantages of the other Blackstone Valley towns. It does not touch Rt. 146, the valley's transportation spine, and it barely intersects to qualify as one of the National Park site communities. It may be that Leicester is considered much more a core part of Worcester's economy than of the Blackstone Valley's. In any case, mill values are falling and, with the exception of the Watson Mill, the community is taking no municipal action.

The question of optimal uses for old mills appears to be critical for their successful revitalization across the valley. These mills were built for large-scale industrial uses, ranging from textiles to machinery manufacturing to foundry work and the making of leather. Among the most famous of these, the Draper Mill was originally part of Ada Ballou's utopian experiment at Hopedale.[18] And the Whitin Machine Works in Whitinsville was a leading manufacturer of textile machinery in the country.[19] Unfortunately, we no longer make these products in any significant number in the Blackstone Valley or even in New England. Moreover, industrial processes have changed dramatically from the four and five story structures created by 19th century millwrights to the Henry Ford inspired manufacturing plants of the Midwest to today's single story "tilt up" structures. Converting these buildings for today's large scale manufacturing, given modern building codes, is in most cases too expensive. Of the 40 mills surveyed, only seven have manufacturing uses. In some cases, there are small companies that manufacture goods, that participate in our high technology culture, and that undertake research and development activities. One such example is Sutton's Polyvinyl Films, Inc., a maker of plastic food wrap in the Dupont Street Mill. In other cases, manufacturing companies fully occupy their own mills. One of these is the S & D Spinning Mill in Millbury, which has a unique market: It is the only manufacturer in the nation that produces the yarn used in baseballs for Major League Baseball.

Most communities in the valley that house mills would welcome manufacturing, provided it was environmentally clean and met customary performance standards

**Table 2. Change in Tax Revenue Contributions for Millbury Mills, 2000 to 2008**

During the same time period, 2000 to 2008, total property tax revenue contributions to the Town of Millbury grew by 81%.

| Mill | Percentage Change in Mill Tax Revenue 2000 to 2008 |
|---|---|
| **Cordis Mills** | 1,104% |
| **Rhodes Cotton Mill** | 126% |
| **Wheeler Cotton Mill** | 66% |
| **Ramshorn Mills Inc.** | 46% |
| **S & D Spinning Mill*** | 37% |
| **Steelcraft, Inc.** | 21% |
| **Felters Company Mill** | 18% |
| **Casyl Mills, Inc.** | 9% |

Source: Authors' research

governing noise, particulates, vibration, radioactivity, and lighting. They recognize that manufacturing is part of their cultural legacy and that they typically offer living wages for their workers. Unfortunately, given the lack of demand for their output, formidable zoning and building codes, and the mills' less than efficient spaces for modern manufacturing, they have, in most cases, had little choice but to begin to broaden allowable uses. Hopedale's Draper Mill is an excellent case in point. Located halfway between Route 495 and Route 146 in the middle of Hopedale's famed model industrial village, it would appear to be an excellent site for industrial use. And yet, because of the above factors, it has been vacant for years. Little wonder that the town is beginning to examine alternatives to industry and is reviewing zoning options for other uses.

Most of the valley's towns have recognized the issue sooner than Hopedale and have changed the zoning code to allow for retail, offices, housing, and other uses. We expect other "mixed use" options to follow. One excellent example of this, Sutton's Manchaug Mills, houses the highly successful Vaillancourt Folk Art, maker of finely crafted folk art pieces, along with 20 other tenants in a beautiful granite faced mill 2.5 miles from an exit off Route 146. Also undergoing regeneration, the Whitin Mill in Northbridge will welcome a nonprofit enterprise, residences, retail shops, and cultural activities. It is clear that the Blackstone towns no longer see a long-term manufacturing future for most of their mills and are expanding land use and zoning options to reflect this reality.

Beyond their role in history, culture, and the morphology of their communities, are the mills the potential beneficiaries of financial factors that would make them candidates for public support through grants, tax increment financial agreements, or other public-private partnership initiatives? The answer is mixed. In the case of Uxbridge's Stanley Woolen Mill, located along one of the most beautiful parts of the Blackstone Canal, the failure of former owners to pay taxes has resulted in a large tax lien on the property. The town has refused to forgive this debt and the owner has failed to gain sufficient funds to rehabilitate the site for occupation. The net impact is that the structure is gradually rotting away.[20] Could the case have been handled differently? In theory, the town could have forgiven the back taxes, created a workable Tax Increment Financing Agreement (TIF), and provided suitable zoning. The owners could have raised more funds and obtained a long-term credit line from a bank. But the town is cash-strapped and looking at the short term. In the meantime, few banks are willing to provide financing to an apparently underfinanced owner for unapproved uses in a volatile market on a rotting structure: Timing is everything.

However, there are other examples where the valley's towns have been willing to invest. In some cases, though, the town had little choice as the mills were either totally or partially destroyed by fire. Examples include Grafton's Fisherville Mill, Sutton's Pleasant Valley Mill, and Uxbridge's Bernat Mill. The Fisherville Mill site has now received millions in brownfield remediation grants and is well on its way to restoring the vitality of this village.[21] In others, the town has become a key participant by helping to write grants, change the zoning, remediate brownfields or provide TIF assistance. Northbridge has been the most active participant, with three of its mills having received some kind of assistance from the town. Clearly, there is extensive interest.

### Keys to Return on Investment

But have the mills contributed increased revenues to the towns that have worked to make them viable? The jury is still out. In some cases, the mills have added value while in others they have not. Several critical factors have influenced returns on investment. First, if a mill is primarily in industrial use, chances are it is less likely to be adding tax revenue to the community at the same rate as through other uses. Of the seven mills devoted primarily to manufacturing, three paid less in tax revenues in 2008 than in 2000. For example, Grafton's Lower Washington Mill paid 34 percent less in property taxes to the town in that period. In contrast, the overall percentage change in total taxes collected by the town during the same period was 55 percent. The remaining four mills did add value but far less than the overall percentage change in their home towns. In fact, none of them came close to matching the rate of overall property tax collection growth from 2000 to 2008. While one cannot determine all of the reasons for this, it appears that a lack of demand for these structures and an unwillingness of owners to reinvest in them would be most likely. Should the valley's towns be concerned? Clearly, they would want these structures, at a minimum, to keep pace with the growth in tax revenues. However, note that all six of these mills are active, with vibrant companies that provide jobs for the valley's workers. We can only conclude that property tax payments are only part of our story!

Second, mills are not all dinosaurs. Of the 40 mills examined, four are tax-exempt, and 18 declined in tax payment contributions while another 18 increased tax payments. This point requires further analysis: Of the 22 active-use mills that pay taxes, 68 percent contributed more tax revenue in 2008 than in 2000. Of those that declined in tax payment contributions, 11 were vacant, mostly vacant, or demolished; and two had major fires. These conditions would have stimulated a decline in value whether they were mills or modern facilities in an industrial park. In other words, it appears that old mills can function

similarly to any other industrial structure in the marketplace. If they are actually used, their assessment will be at a market rate; if not, they will decline in value.[22]

Third, if an owner does invest in revitalization, it will likely result in increased revenues to the community. Between 2000 and 2008, five of the six revitalized mills yielded higher returns for their home communities. This suggests that, overall, mills can be upgraded and contribute to the community. It is not an earth-shaking finding! However, many doubters — and there are many — of mill revitalization should take notice: The redevelopment of mills can make money!

Fourth, it appears that locally owned mills are more amenable to revitalization. Of the 18 mills revitalized between 2000 and 2008, 14 (78%) were locally owned. We do not have a clear explanation for this except that it suggests that these owners are committed to the valley as a community rather than simply as a place of business and that, because they are "on the ground," they have a clearer sense of the marketplace.

And the towns? Have they recognized these mills as investment opportunities? According to their planning documents, all of the towns have noted the importance of at least some of the mills in their communities. There appear to be three trends. First, towns like Millbury and Grafton are endeavoring to develop processes that will make revitalization easier. These include flexible zoning, the possibility of TIF agreements, and the potential for grant funding. Such tools place planners in a position to negotiate mill revitalization agreements that best meet the needs of the community. Second is that the towns consider some mills worthy and others unworthy of development. They are picking mills with developer interest or of critical value to the town. Third, the data show that most of the towns have either economic development or community development corporations that can assist mill owners and others in regenerating their structures. (It is striking that Leicester and Uxbridge, two of the communities with the greatest need, have not chosen to create one of these corporations.) In short and on the whole, these Blackstone Valley communities consider their mills to be important. They are giving the mills appropriate attention.

## Conclusions

We began this paper with the premise that the Blackstone Valley had rediscovered its mill heritage and that its mills were becoming crucial components in the valley's regeneration. Is it supported? The data suggest *yes* in some cases and *no* in others. Here are our findings:

1) The public-private partnership is critical to the success and revitalization of the mills. This partnership includes regulatory and financial assistance.

2) Most of the towns recognize that old mills are important but not to the point that all should be maintained. They are willing to pick the best and ignore the remainder.

3) The towns increasingly recognize that these mills will not be used for industrial purposes and are changing their zoning to reflect the need for other uses.

4) There is an apparent pecking order for obtaining the greatest return on assessed value: Buildings that have been converted to housing contribute more to the local tax base. They outperform commercial uses, which, in turn, trump industrial uses.

5) Mills have, for the most part, increased tax contributions to their local municipalities, but not as rapidly as other properties have during 2000 to 2008.

6) If a mill is locally owned, it appears to have a better chance of being revitalized than if it is owned by distant landlords.

At this moment, the Blackstone Valley mills would appear to be secure. They are respected, they are wanted, and their substantive activity will remain reliant on active uses on the immediate time horizon. The valley may have been revolutionary, but today it is a highly pragmatic place!

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**Endnotes:**

1.) These conversions have been ongoing for many years. For a look at several early efforts, see Leslie E. Donovan, Charlotte K. Barrett, *The Mill Works Handbook*, (Washington D.C.: The Preservation Press, 1983).

2.) Robert Campbell, "Industrial Strength," *Boston Globe*, November 30, 2008, N3.

3.) For four case examples, see Massachusetts Office of Housing and Community Development, *The Smart Growth/Smart Energy Toolkit*, http://www.mass.gov/envir/smart_growth_toolkit (January 23, 2009).

4.) For a concise overview of the history of MASS MoCA, see MASS MoCA, *History of the Site*, http://www.massmoca.org/history.php (January 23, 2009). The Olneyville revitalization is expected to dramatically change the western part of Providence. See Elizabeth Abbott, "Progress in Reviving an Urban Desert," New York Times, July 30, 2008, C4.

5.) Harrisville is considered one of the most beautiful mill villages in New England. For more on its character, see John Bordon Armstrong, *Factory Under the Elms: A History of Harrisville, New Hampshire 1774-1969* (Cambridge: The MIT Press, 1970).

6.) These elements are carefully explained in Steve Dunwell, *Run of the Mill* (Boston: David R. Godine Publishing, 1978).

7.) Jane Jacobs, *The Economy of Cities* (New York: Random House, 1969), 203.

8.) Theodore White, *The Making of the President 1960.* (New York: Atheneum, 1961), 341.

9.) Tizor Systems has since been acquired and BlackFriars Communications is now JB Communications. For more on the Clock Tower Place story, see Zenia Kotval, John Mullin, and Zeenat Karamchandani, "Partnerships and the Fiscal Implications of Planning and Development: A Case Study of Maynard, Massachusetts," *Planning Practice and Research*, 23, no. 4. (November 2008), 461-478.

10.) Scott Kirsner, "Through Ups and Downs, Creative Mill Grinds on," *Boston Globe*, January 4, 2009. (http://www.boston.com/business/technology/articles/2009/01/04/through_ups_and_downs_creative_mill_grinds_on/) (Jan. 23, 2009).

11.) For analysis of the Digital story and how it came to the mill, see John Mullin, Jeanne Armstrong, and Jean Kavanagh, "From Mill Town to Mill Town," *Journal of the American Planning Association*, 52, no. 1 (1986), 47-59.

12.) Famed industrial photographer Randolph Langenbach considered it to be "perhaps the most beautiful mill set in landscape constructed in the United States." The pictures of the mill before and after the fire are quite stunning. See Randolph Langenbach, *The Crown and Eagle Mills, North Uxbridge, Mass.*, http://www.conservationtech.com/x-milltowns/tl-photographs-4x5/Crown-&-Eagle/C&E-(1).htm (Jan. 23, 2009).

13.) U.S. National Park Service, *Blackstone River Valley National Heritage Corridor: Laws & Policies*, http://www.nps.gov/blac/parkmgmt/lawsandpolicies.htm (Feb. 3, 2009).

14.) For a concise analysis of the Lowell story, see Ross J. Gittell, *Renewing Cities*, (Princeton: Princeton University Press, 1992), 65-93.

15.) U.S. Census Bureau and Central Massachusetts Regional Planning Commission, "Population Projections: 2000 to 2030," http://www.cmrpc.org/document_detail.aspx?page_id=34&document_id=244 (accessed February 3, 2009).

16.) The average median residential sale price for the 12 towns of the Blackstone Valley rose 129% from 1996 to the first six months of 2006, when prices began to decline. For more information see Central Massachusetts Regional Planning Commission, "Annual Median Residential Sales Price," http://www.cmrpc.org/document_detail.aspx?page_id=34&document_id=56 (accessed February 3, 2009).

17.) All mill buildings in each town, 10,000 square feet or larger, were included in this study.

18.) For a review of the rise and decline of Hopedale, see Edward K. Spann, *Hopedale: From Commune to Company Town 1840-1920* (Columbia: Ohio State University Press, 1992).

19.) For a history of the Whitin Works, see Thomas R. Navin, *The Whitin Machine Works Since 1831* (Cambridge: Harvard University Press, 1950).

20.) For more on this story, see Danielle Ameden, "Developer says second mill almost ready for tenants," *Milford Daily News* (July 25, 2007), http://www.milforddailynews.com/homepage/x1441306934 (January 23, 2009).

21.) Donna Boynton, "Fix Fisherville Pond Dam: Safety issues are new to mill project," *Worcester Telegram & Gazette* (December 16, 2007), http://proquest.umi.com/pqdweb?did=1400281381&sid=1&Fmt=3&clientId=81890&RQT=309&VName=PQD (February 3, 2009).

22.) Clock Tower Place provides an excellent example of how this occurred. See E. Noonan, "Valued Clock Tower Place Soars: Assessment Up More Than Tenfold," *Boston Globe* (July 1, 2004), Globe West section 6.